PROGRAMA DE PESQUERIAS

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IN HOUSE RESEARCH PROGRAM RESULTS

February - April 1991

By

Ramón Buzeta
SPO Fisheries (LARO)

ON THE DEVELOPMENT OF A CONCEPTUAL FRAME FOR THE APPLICATION OF AN INTEGRATED COASTAL DEVELOPMENT (ICD) PROGRAM FOR ARTISANAL FISHERIES IN LATIN AMERICA

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SUMMARY REPORT

1. INTRODUCTION.

Since 1982 the Fisheries Program in Latin America initiated a review of the regional priorities in the continent with special focus on the present status and future trends of the fisheries production, the infrastructure for research and the potential for development. In particular, attention was paid to the perceived needs stemming from discussions between the fisheries researchers, government agencies and the producers (small scale fisherman, rural aquaculture producers) which participated in regional meetings promoted by the IDRC.

The results of these exercises was a clearer view of the regional needs and priorities which permitted succesives adjustment to the action plan that the IDRC Fisheries Program was starting to implement in Latin America i.e., a higher emphasis was placed in artisanal fisheries and coastal management because of the increasing importance that the coastal marine production had both for the local consumption and export of marine food commodities.

Artisanal fisheries was also enlighten by these studies as an important economic activity in job generation and income for a large population (3-5 millions) living along an extensive (over 20 000 Km) coast line.

The projections for the next decade showed also that the requirements of the continent in terms of food of aquatic origin were higher than the expected production, in view of the overexploitation of the marine resources, the acute degradation of the marine environment and the high pressure of the export market. The combination of these factors would likely result in a further decrease of the already low fish consumption rate (5 Kg/person year) average for the continent.

The Fisheries program in Latin America had initiated back in 1985 as a result of the analysis described, an integrated approach for the development of artisanal fisheries based in the coastal communities, which we called ICD, (Integrated Coastal Development) and that consisted in a multidisciplinary view of the development process, taking into consideration the bioecologic problems related to the Management of the marine Resource and the Environment, the Technologies utilized by the artisanal fisherman in their production activities, and the socio economic and cultural problem affecting the coastal communities on the Development process.

The rational followed by the Fisheries Program, the status of the fisheries sector, the projection toward the end of the century and a tentative Workplan were condensed on a comprehensive document (Fisheries 2000) prepared by the Program staff in collaboration with a consultant firm from Canada (AGRODEV Consultants) which was discussed with other programs and Divisions within IDRC in 1990.

The report recommended to further review the application of the ICD Model as a valid strategy for the development of the artisanal fisheries sector in LDC's where IDRC keeps an active presence. It was then considered appropriate to commission the LARO fisheries SPO to spend a 3 months period in one of the leading latinamerican projects where the ICD concept is being applied, to review "in situ" the implications, problems and achievements of the model, and its potential for the future.

This task took the form of an "In House research" (IHR) that the SPO would conduct in the project Fisheries Development (Chile) II, 3-P-89-0141 executed by the Catholic University of Chile (Talcahuano) between Feb/April 1991.

2. METHODOLOGY.

The methodology applied during the IHR was first to assemble a multidisciplinary group under the ICD Committee (Chile)* to prepare discussion documents that would serve as a base for a series of three Mini-Seminars that the SPO would convene and direct to examine the different aspects of the ICD Model (see chapter 3). The organization of a multidisciplinary group to work under the SPO was an essential element in the success of a comprehensive discussion of all aspects of the integrated model that was the final objective of this exercise.

(* The ICD -Integrated Coastal Development Committee is a working group established by the Artisanal Fisheries Network, one of the regional coordinating mechanisms supported by IDRC in the region which is formed by the leaders and senior researchers of all projects related with artisanal fisheries activities in Peru, Chile Colombia and Brazil. This Committee has corresponding branches in each of the four countries, that provide advice and assist in the coordination of integrated activities to the Regional Network. The ICD-Chile committee is the natural focus of all Artisanal Fisheries activities promoted by IDRC in Chile and includes university researchers, and fisherman associations in a joint body.)

A total of 6 discussion documents were prepared by a group of different specialists (1 Fisheries Biologist, 1 Ecologist, 2 Rural extensionists, 1 Sociologist, 1 Adult Education specialist, 1 Economist) for the three Mini-Seminars of 1-2 days duration each.

The three Seminars were focused on:

1.- The situation of the marine Resources and the Environment.
2.- The Technology utilized by the Artisanal Fisherman and problems related to their use and transference,
3.- Socio-economic problems related to the development of Artisanal Fisheries communities.

The working group was first assembled in February 1991; a briefing was given on the scopes and terms of references for the group and the task of review of literature and preparation of discussion material was assigned to each specialist in particular. The SPO met regularly with each one during February - March to review and edit the discussion documents and to plan the execution of the three seminars. The following agenda was completed:

FEBRUARY 91.

Assembling of the multidisciplinary group. Briefing of the specialists. Assignment of review task on the three elements of the ICD model.

MARCH 91.

Preparation of discussion documents on Resources, Technology and Artisanal fisheries Development aspects. Independent meetings with each group (4,8,17,23 march).
First Mini-Seminar (Technology). 15-16/March.
Second Mini-Seminar(Resources). 26/March.

APRIL 91.

Third Mini-Seminar (Development). 5-6 April.
Joint working group meetings to review seminars results.8-15/April.
Review and editing of resulting documents. 16-30/April.

An additional period was used in June to review the tapes transcriptions of the three seminars, further discussions with the seminar participants and project leaders, and preparation of the English Executive Summary.

A final Document reviewing the three basic elements of the ICD Model and the results of the discussions held at the Three Mini-Seminars (in Spanish), will be presented to the 3rd. Latin American Seminar on Artisanal Fisheries to be held in Lima, Peru on 21-25 October 1991. A summarized spanish version based on the taped transcription of the discussions and conclusions of the Mini-Seminars will be provided to the Artisanal Fisherman Association (CONAPACH) in Chile for information and dissemination.

3. ON THE ICD MODEL.

The ICD model is the result of a long process of analysis and discussions on the basic elements and the dynamics involved in the development of artisanal fisheries. It was first conceived as a set of actions required to trigger the development process based on small coastal communities devoted to artisanal fisheries activities in Latin America.

This model has not been previously described and is an intellectual product of the conceptual frame developed by the author to cope with the challenge of orienting the development activities necessary to promote the improvement of the Artisanal Fisheries sector in Latin America.

The IDRC Fisheries Program in LARO had initiated back in 1982 a process of reviewing the Program rationales in the continent to adjust its action to the perceived needs. This was achieved by the implementation of a series of meeting including researchers, government agencies and the organized fisherman. Problems and priorities were reviewed and a workplan emerged that was executed by a number of integrated artisanal fisheries projects that were implemented in the main fishing countries of the region, were extensive artisanal fisheries communities existed (i.e., Chile, Peru, Brazil and Colombia).

From the activities of these projects, centered in a variety of subjects relevant to the artisanal fisherman way of life, it was evident that a primary grouping of these elements into categories of closely related subjects was possible. These categories were:

1. the Natural Resources upon which the artisanal fisheries activities was based, and consequently the Environment which contained these resources,
2. the Technology utilized by the artisanal fisherman to exploit these resources (capture, processing, cultivation), including the generation, adaptation and transference of technology to the users, and
3. the socio-economic and cultural aspects related to the life and production activities conducted by the artisanal fisherman and its communities, which can be assimilated to a concept of Community Development.

These three units are closely connected and form a network of interrelations that it is necessary to analyze and describe prior to act upon them.

The model that was chosen is a three dimensional system which can be appropriately described in mathematics terms by the sets theory. The three categories described above (Resource, Technology, Development) configured primary fields (R,T,D) that overlap in some points creating new secondary fields (RT, RD, TD,) which comprise different activities related to different specialization areas. (FIG.1)

Following a short description of the primary and secondary fields as related to the artisanal fisheries activities.

3.1 THE BASIC ELEMENTS.

RESOURCE AND ENVIRONMENT

Activities in this field relates to research into the lifecycle of commercial species of importance for the artisanal fisherman and on the environmental conditions for the existence of those species.

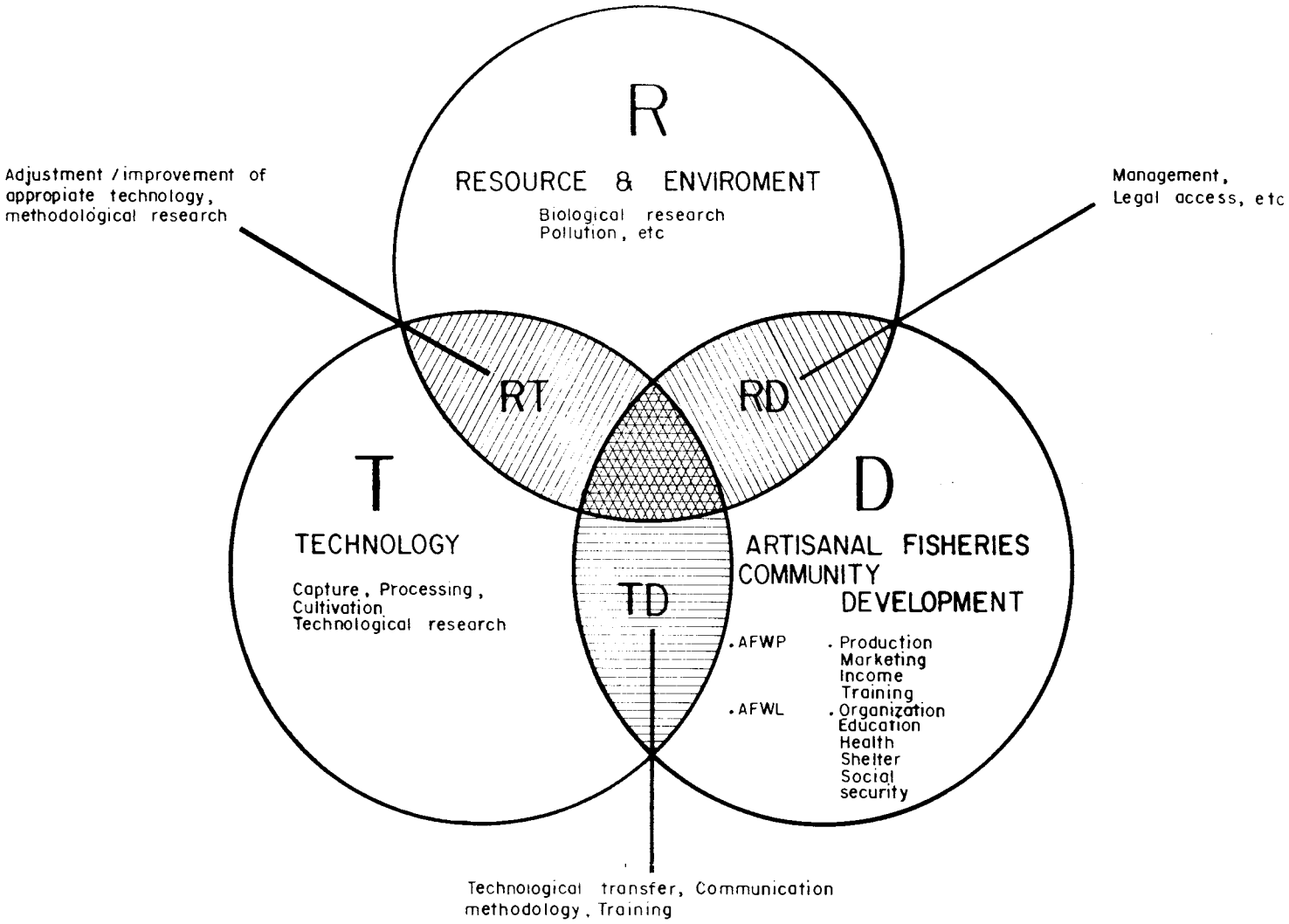
It is also related to the changes occurring in the natural resources submitted to exploitation and in the proper administration of the resource and the environment. Aspects of overexploitation of resources, pollution and degradation of the environment are particularly considered here.

This is the field of biologists, ecologists, oceanographers, climatologists, environmentalists, etc.

TECHNOLOGY.

Subject of this field are the generation and adaptation of technology for capture, processing and cultivation of aquatic organisms. The development of appropriate technology for the optimization of the production process is based on scientific knowledge which is being advanced by scientific research conducted at Universities and private research institutions. This is the field of marine and fisheries technologist, naval engineers and specialists in all fields of technology utilized in the exploitation of the marine resources.

Fig. 1 THE INTEGRATED COASTAL DEVELOPMENT (ICD) MODEL AND MAIN COMPONENTS



COMMUNITY DEVELOPMENT

This is one of the most important fields for artisanal fisheries development as relates to the production activities and the socio-economic and cultural aspects of the activities of artisanal fisherman communities.

This is the field of specialists in Social, Human and Economic sciences. The problems dealt with here are related to the artisanal fisherman way of life, and the artisanal fisheries mode of production, centered in the community. In the Artisanal fisherman way of life, the main concern are Housing, Education, Health and Social security. In the production mode, the concern relates to efficiency in the process of production, commercialization and income generation.

3.2 INTERPHASE FIELDS

Resources/Technology .

This is an interdisciplinary field that require the attention of the specialists from both primary fields involved, to cope with problems of rational exploitation, adaptation of appropriate technology for capture, cultivation, processing, and harvesting methodologies of natural resources of commercial importance for artisanal fisheries. Such interaction is better served by the creation of multidisciplinary working groups that apply to the solution of specific problems.

Technology/Development.

This is an important interdisciplinary field because the appropriate technology generated in the primary "T" field is conveyed to the user in a process initiated in this T/D field. All technology transference activities are centered here. It requires the input of both technologists and social sciences specialists, and particularly communication specialists and field extensionists. All aspects of specialized training fall here, inclusive the creation of a communication methodology adapted to serve artisanal fisherman.

Development/Resources.

This field describes the interaction between the fisherman and the Resource, particularly legal access, administration and management, and property rights. Activities in this interdisciplinary field are rather new, as the fisherman is just initiating a movement toward gaining full access to the management of the coastal zones for mariculture.

It is also the focus of potential conflicts as the different interests in play start to compete for exclusive rights of access to the Resource and the Environment.

3.3 THE COORDINATION OF MULTIDISCIPLINARY EFFORTS.

The application of the integrated model in the development actions is essential to understand where every piece fits and what are the implications of projects action in the whole.

The ICD model is a conceptual frame and a tool at the same time, since it permits to properly plan the development activities and foresee what the midterm effect could be. It also serve as a guide for the activities of multidisciplinary working groups which can apply concerted actions to achieve common goals.

The existing artisanal fisheries projects promoted by IDRC in Latin America have been consistently applying this methodology in order to advance in the achievement of the project objectives. This is also a learning process as through their action they are contributing to improve the model.

Following a list of Artisanal Fisheries projects related to the ICD Model in the LARO region:

Table 1

LIST OF PROJECTS RELATED TO THE ICD MODEL IN LATIN AMERICA

No.	Name	Country	Institution
88-0040	Tuna	Brazil	CEPENE (IBAMA)
88-0119	Fisheries Tech. Transfer	Chile/Regional	Catholic Univ. (Talcahuano)
88-0191	Artisanal Fisheries	Peru	IMARPE
88-0236	Artisanal Fisheries	Colombia	INDERENA/FES
88-0380	Marine Farms	Chile	Catholic Univ. (Talcahuano)
89-0048	Invertebrates III	Chile	Catholic Univ. (Santiago)
89-0140	Fish. Training Seminar	Chile/Regional	PRAIS/Concepcion
89-0141	Fisheries Development II	Chile	Catholic Univ. (Talcahuano)
90-0168	Integrated Coastal Dev.	Peru/Regional	ECODEMAR
90-0169	Fisheries Communication	Chile	CONAPACH
91-0025	3rd. Art. Fish. Seminar	L. America	ECODEMAR

The exercise conducted during the IHR was oriented to assess the status of the application of the ICD model to the particular condition and the dynamic occurring in the artisanal fisheries sector in Chile as a case study for other countries of the continent. Chile is opening up to the external market as a result of the full application of a neo liberal, free enterprise system. This has result in a several folds expansion of the exploitation of its marine resources, reaching some 5 million plus metric tons in 1990 with an export value of over US$ 900 millions. The artisanal fisheries sector has been strongly committed (and affected) by this process.

In the next chapter we will examine in detail the chilean case discussed in a series of three Mini-Seminars conducted to analyze the different aspects of the model.

4. WORKING GROUP DISCUSSIONS AND RESULTS

MINI-SEMINAR ON RESOURCE/ENVIRONMENT FOR ARTISANAL FISHERIES

The meeting was attended by a total of 17 participants (see annex 1.1. List) from five Universities (Concepcion, Catholic, Santiago, Catholic Talcahuano, Austral, CICESE, Mexico), four IDRC supported projects and two consultants.

The subject on this Seminar was to examine the first component of the ICD model (i.e., Resources and Environment) and in particular what are the present procedures and policies for administration of the marine resources exploited by the artisanal fisherman, i.e.:

- Are they adequate?
- Who is responsible for the management of the resources?
- What is the participation of researchers and specialists in the management decisions?
- What means are there available to accomplish their mission?

The discussions during the workshop have been centered in the following:

I.- AGENDA

March 26, 1991

1.- Status of the Resources and Environment
2.- Legal access and properties rights.
3.- Alternative uses of coastal areas. Problems of industrial and urban pollution.
4.- Discussions and conclusions.

II.- DISCUSSION.

1.- On resource management.

1.1.- The control on the fishery is poor. Only a few monitoring activities related to a limited number of caletas are in place. Statistics refer only to a few species (i.e. chilean abalone, sea urchin, seaweeds, some whitefish) which are important for export.

1.2.- The models applied to industrial (monospecific) fisheries are not useful for artisanal fisheries. There are but a few specialists in stock assessment. Administration of coastal zones by ecological models (i.e., genetic reserves) also refers to a few experimental cases and involve just a few species so they are still highly inconclusive.

Studies in minimal sizes, spawning season are of little use because of high local variation on the very long coast line (2400 km). It is not possible to establish a unique centralized control system so it will be necessary to tackle the problem on a region by region basis. Material limitations (cost, number of specialists involved), makes it difficult for such a plan to be extensively applied right now.

1.3.- There is virtually no participation of universities and/or fishermen in the decision process for the management of the resources at present.
The are a few diagnostic studies on the status of commercial stocks (seaweeds, chilean abalone, some invertebrates). These are seldom taken into account when making management decisions which are based rather on political, and economical considerations.

1.4.- The fishermen organizations are interested in taking responsibility for the administration of the resources (provided they have exclusive rights of access). This alternative would require permanent advice from the researchers, since the fisherman do not possess the technical background to accomplish such a task.

1.5.- There are a few cases (i.e. Austral University, Catholic University) where a university establishment has taken responsibility for management of coastal zones in favor of small producers.
These experiences are positive, but require longer term evaluation to ascertain their validity on a long time frame.

1.6.- An important question raised is if the policy of free market and open access to the resources is compatible with the proper administration of the resource. The present experience shows that the pressure of foreign demand very rapidly result in overexploitation of the resource and abuse of the environment.

It is necessary to investigate ways by which the management of the resource and the environment (i.e. area rotation in coastal leases under fisherman administration) can be implemented in pilot cases.

1.7.- Historically, there have been some cases of resource management implemented by coastal communities on limited areas which traditionally have been exploited by artisanal fishermen. This has worked well under normal conditions of supplying local markets.

The problem seems to be the several folds expansion of demand triggered by the export market. External demand can not be regulated as it responds to external (international) factors.

On the other hand, local demand that can be quite attractive (i.e., tourism; "captive" markets in schools, hospitals; local population) can be better regulated by the artisanal fisheries suppliers.

2.- On the legal status of the coastal zones

2.1.- The present legislation does not guarantee the access to the resources for artisanal fishermen in spite that it recognizes a reserve of 5 miles wide for exclusive artisanal fishing operations; Ambiguities in the legal structure allow the intrusion of industrial boats in the 5 miles coastal zone.

2.2.- The new fishing laws regulate the establishment of Regional Councils where there is a small participation of the National Fishermen Association, among others. Nevertheless, management of the resources is a regional matter and according to the recommendations from the researchers it should be regionally administered. However, the representation of regional fishermen associations is not appropriate as this is allocated on a national base.

2.3.- As referring to the implementation of Mariculture by artisanal fisherman it is necessary to review the decision making process for the assignment of coastal leases. Now, there are too many ministerial agencies involved, and the rules of the game are not crystal clear which result in cumbersome procedure, permitting violation of the rule of priority for long existing coastal communities.

3.- On the incorporation of cultures as a complementary activity to the administration of coastal leases.

3.1.- It is necessary to develop an experience in small polyculture systems similar to those the artisanal fisherman communities are likely to have access to.

The present experiences in pilot plots runned by fisherman communities show that the lack of seeds, credits and technical assistance is a serious set back to the effective mariculture production.

3.2.- It has been stressed the need to establish a National system for seed production and distribution. This could be regionally based to cover needs in each region.

3.3.- In order that the fisherman may become an efficient administrator of mariculture enterprises it requires specialized Training. Such training should include economic administration as well as bioecological one.

3.4.- The introduction of exotic species has also created new problems to the existing resources (introduction of diseases) and the environment (destruction provoked by new species i.e., salmon feeding contamination on stuarine areas). In most cases it has been found that the negative impact outbalance the economic gains.

4.- On Pollution

4.1.- The application in Chile of a macroeconomic model that promotes export and privileges industrial development, has resulted in a large expansion of the mining, forestry and fisheries activities.

The industrial plants currently discharge their toxic wastes in rivers and bays creating severe cases of pollution in the same areas where intense fishing and mariculture activities occur. On the other hand, urban growth has resulted in a several folds increase of the large cities discharge of waste waters in the same river and coastal outlets causing spread of contagious diseases that often take the form of extensive epidemics infections (i.e., Cholera, Salmonellosis, Hepatitis, etc.) among local populations.

4.2.- The existing regulation of industrial contamination in Chile is thought to be adequate. The problem is that it is not strictly adhered too for lack of control. The main responsibility for approval of new installation is placed upon the National Maritime Administration.

The regulations are only applied to newly established industries; old one represents a difficulty because installations are already in place and it is anti economic to stop them to introduce antipollution procedures. A dual system is then in place which bring antagonisms and arguments between industries and the government when the present National policy promote industrial investments.

4.3.- It is reported that foreign investors do not respect regulations existing in their own countries when opening operations in the third world (i.e. Chile). A minimum requirement should be to force investors to comply with the same rules and regulations existing to control contaminants in their home countries to their new installation in Chile.

4.4.- The concurrence of artisanal fishermen, industries and regional administration within the newly established Regional Councils will be necessary to control industrial pollution in the fishing areas (in some regions,where the Fishermen are organized, a more active debate on pollution issues has taken place at the community and the industrial plants are more amenable to control).

4.5.- The problem of control of urban wastes is a far more complicated one as it touches on a complex of interrelated situations with socio-economic roots (i.e., increase of unemployment, migration from rural to urban areas, decrease of public investment in social development due to the external debt, etc.).

The role of fisheries research here seems to be an increase in the awareness of the causes and impact of these problems in fisheries development.

CONCLUSIONS

The management of resources exploited by the artisanal fisheries will have to be a preferential issue in the Regional Councils established by the new Fishing Law approved in Chile.

In order for the administration policies to be effective, it would be necessary to ensure the participation of the fisherman and the researchers on a <u>regional basis</u>.

Such participation can be reinforced by the activities initiated by the ICD Committees where the crucial aspects of resource management can be discussed and planned in a participatory way.

The establishment of pilot mariculture activities, where research projects collaborate with fisherman communities engaged in production activities in coastal leases, is an appropriate ground to implement in an experimental scale alternatives of coastal management that could be further developed into a National program.

These activities should emphasize the use of the Resource and Environment taking into consideration not only the economic profit but also the socio-cultural values of the Communities and the Nation as a whole.

[-SEMINAR ON THE USE AND TRANSFERENCE OF TECHNOLOGY TO RURAL COMMUNITIES

A Parallel between Experiences in the Agriculture and the Artisanal Fisheries Sector

The meeting was attended by a total of 20 participants (see annex 1.2. List) from two Universities (Catholic University of Concepcion), two NGO's (PRAIS and GIA), four IDRC supported projects, three Networks (Aquaculture, Artisanal Fisheries, Seaweed) and four undergraduate students from the career of Marine Technology (Catholic University of Talcahuano).

The subject of this Seminar was to examine the second component for the ICD Model (i.e., Technology) and in particular how the experiences of Technology Transfer to rural agrarian producers can be assimilated by the artisanal fisheries sector.

- What parallels exists (if any) between these two cases ?.
- What are the pros and cons of the agriculture sector experience and how these can be avoided/decreased in the artisanal fisheries sector ?.

The discussions during the meeting were centered in the following:

AGENDA

March 15, 1991

1.- Technology Transfer in the rural sector.
2.- Experiences of participatory planning in the rural area.
3.- Experiences of participatory planning in the Artisanal Fisheries Sector.
4.- Experiences of Technological Transfer and training in Artisanal Fishing Communities.
    a.- Preparation of Videos and extension materials.
    b.- Special courses.
5.- Round Table.

Saturday 16, 1991

1.- Conclusions

The discussion document prepared by two specialist experienced in technological transference to the rural agriculture sector reviewed the experiences existing in Chile on this subject. Subsequently a discussion took place to compare this with similar experiences in fisheries projects.

It was mentioned that a large amount of resources has been dedicated to promote the use of advanced technology by small agriculture producers with very poor results. Failures refers particularly to the lack of participation of the end users in the planning process aiming to introduce the technology.

The experiments reviewed showed that seldom previous work was done to characterize the recipient community, and assert their real needs in open discussions with the final users to plan accordingly the future actions.

It was also noted that:

1.- The recipient communities are characterize by a lack of infrastructure which restrain the possibility of adding value to their products.
2.- The market is not controlled by the producers.
3.- Production is determined by the demand so the small producer has very little power of decision on the type of crop it will grow.

4.- Technology Transfer is determined by the needs and requirements of the market or the agroindustry and thus training is oriented to increase production of raw material not to upgrade the producer capability to access to market or engage in post production processing.

The Technology Transfer process is then presented in the form of technological packages (including use of special seeds, pesticides, cultivation methodology) directed to a small group of producers that can play a role in the supply system for the established agroindustry.

The less efficient producers are left out of the Technological Transfer process (labeled as "with no agriculture solution") and usually end up loosing their land and working as paid laborers in large farms.

When training occur, it is provided either directly by the large enterprises that owns the technological packages and control the market, or by Government agencies that subcontract the same large enterprises to provided the technical training.

Such system does not bring development to the small producers because it perpetuate the dependency on seeds, machinery and know how and reduce the producers to the role of purveyors of raw material at prefixed prices for the established industries.

In the Artisanal Fisheries sector it was noted that experiences are scanty; the question of objectives, rational and final purposes of the Technological transfer process is still under discussion with the recipients as the fisherman is still not clear on the issue of mariculture development and there are not any official government supported program in place.

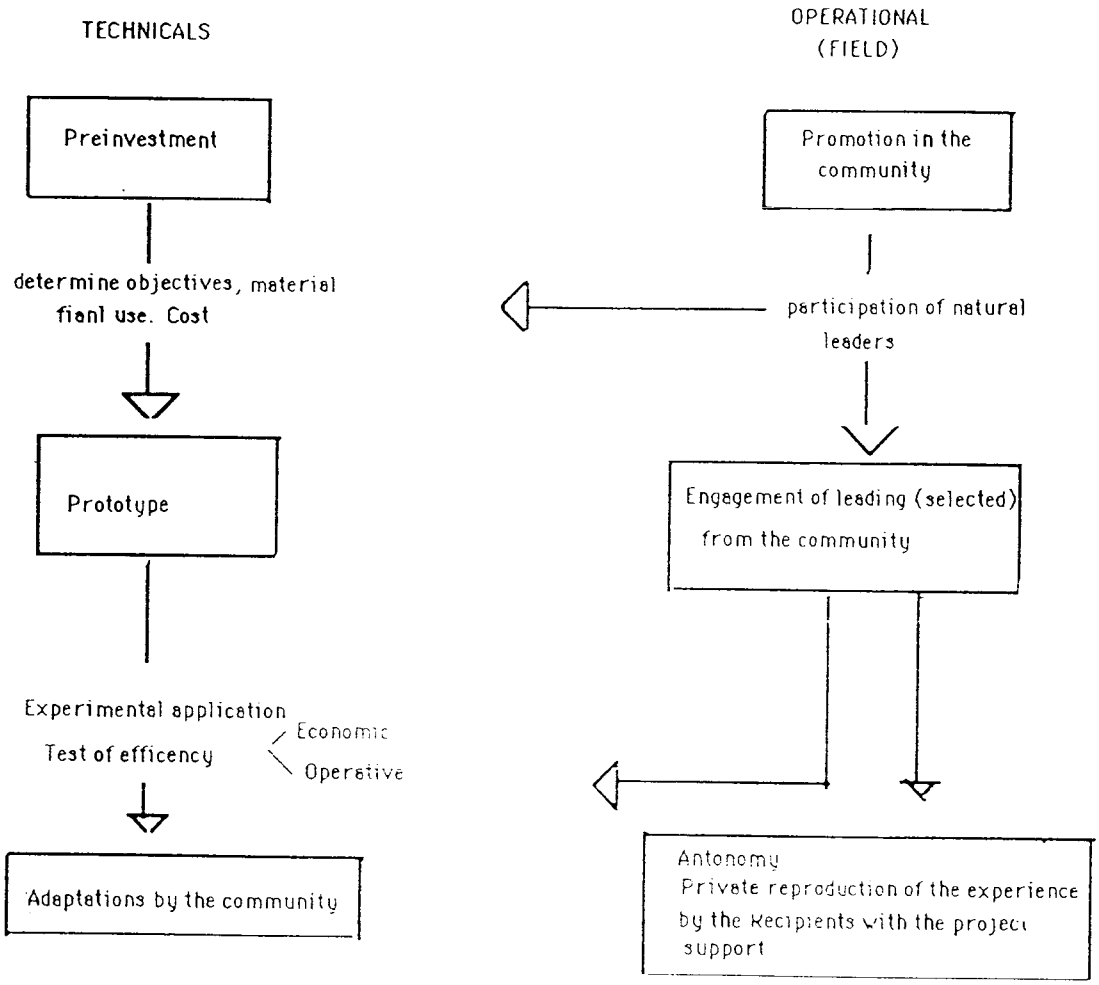
Within projects, the process of access to the coastal community is very similar to the one utilized in the agriculture sector. The Fisheries projects has approached the fisherman community through the natural leaders existing in the community; try to establish joint working group with the most interested elements of the community and where a community organization exist (trade union, cooperative or fisherman association) operate through the existing channels to ensure the community collaboration.

The project experiences of work with artisanal fisherman communities showed that it is important to adjust to the fisherman timing rather than imposing upon the fisherman the researchers own sense of timing.

It was obvious that with a variety of situation things does not always occur smoothly: there are usually problems of leadership, personal conflicts, desertions that the working group have to face before an acceptable pattern of operation can be established.

A diagram of the stages in the process of establishment of participatory planning groups at community level is attached.

Figure 2



The strict following of the sequential stages to establish a participatory planning group in the community to transfer technology is not always possible.

In many reported cases, the research group original objective of conduct only an experiment to test a new technology was altered by the fisherman that wanted to initiate a commercial activity applying the untested technology. The negative response of the research group to transfer untested technology to the community because of the economic risks involved was override by the fisherman who initiated their own experiments without proper supervision resulting in economic losses.

A conclusion on this issue was that **even when the project objective was not Technological Transfer, the execution of pilot activities within a community bring along a risk element. To minimize this risk the project should be prepared to step in and direct parallel experiments to avoid further financial losses to the overeager participants and consequently the early discredit of the tested Technology.**

In general, it was concluded that strong similitude exist between the Technology Transference process in rural and coastal communities. In both cases, the small rural producers and the artisanal fisherman:

1.- Do not add value to their products due to the lack of infrastructure and know how.

2.- It is controlled by the demand .

3.- Do not control the market.

4.- Do not determine the type of technology it uses, rather technological advances are imposed upon them by the market demand and/or the established large industries.

Future actions should take into consideration the existing experiences in the rural sector and adjust methodologies and procedures to the particular conditions of the artisanal fisheries sector.

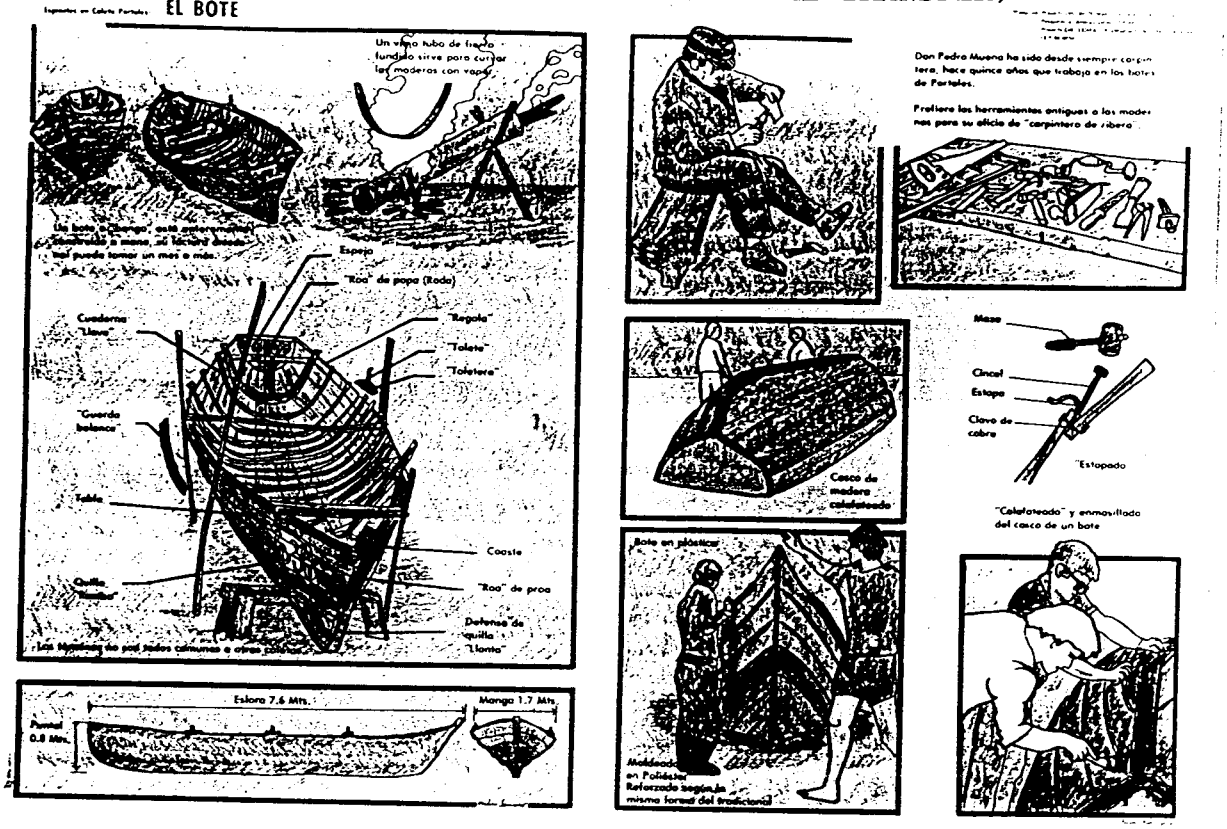
The use and development of methodological tools (i.e.: audiovisual, communication procedures) for use in the technological transfer process should be closely coordinated with the development activities undertaken by the fisheries projects at field level.

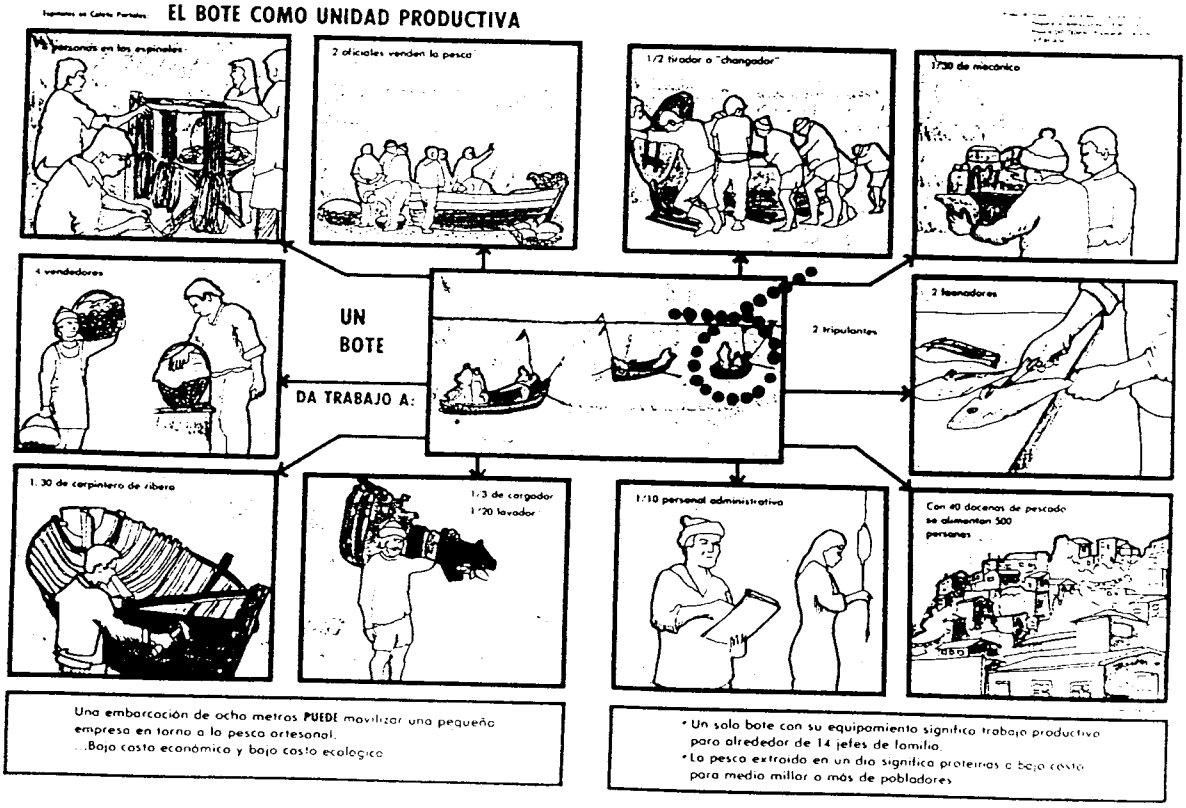
A good case in point are the series of technical posters prepared by the regional project Fisheries Technological Transfer (88-0119), executed by the Catholic University of Talcahuano, who provide material on different technologies that are transferred to the fisherman by the field teams of other fisheries development projects (i.e., 88-0380, 89-0141 (Chile); 88-0191 (Peru)

(See Figure 3)

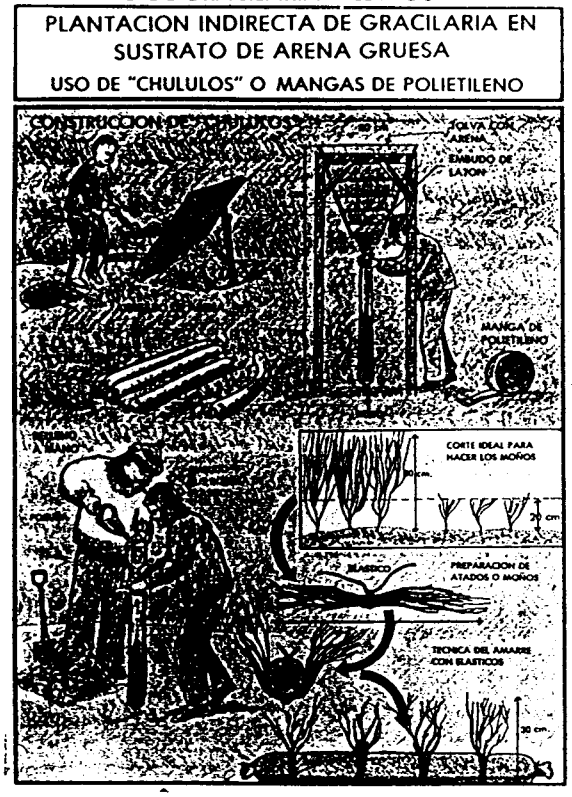
EXTENSION POSTERS

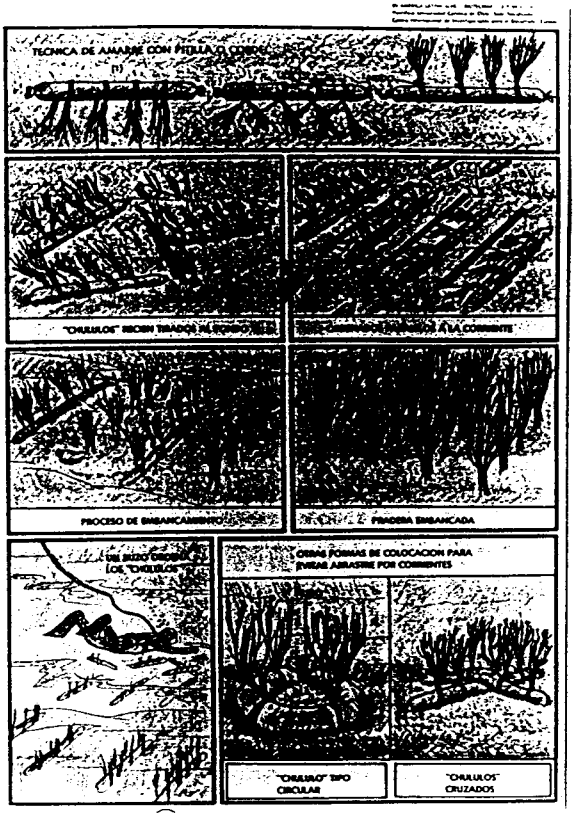
PROJECT 88-0119 (FISH. TECHNOLOGICAL TRANSFER)



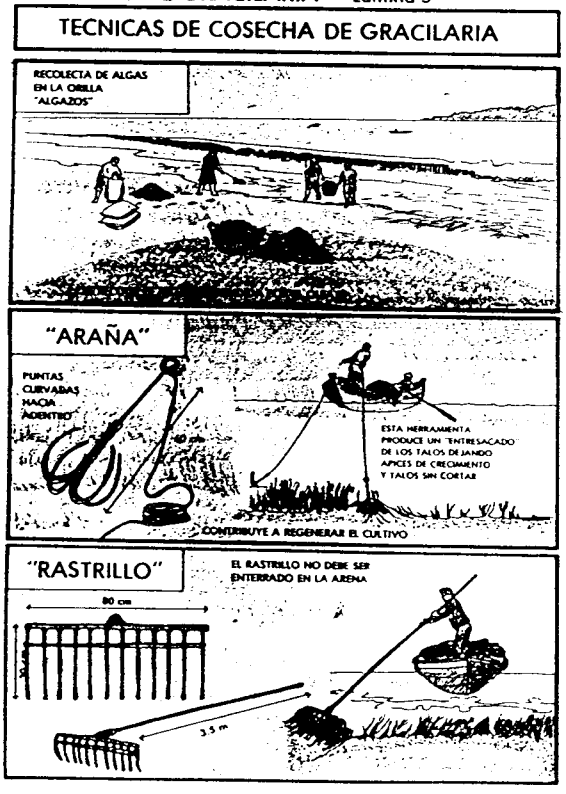


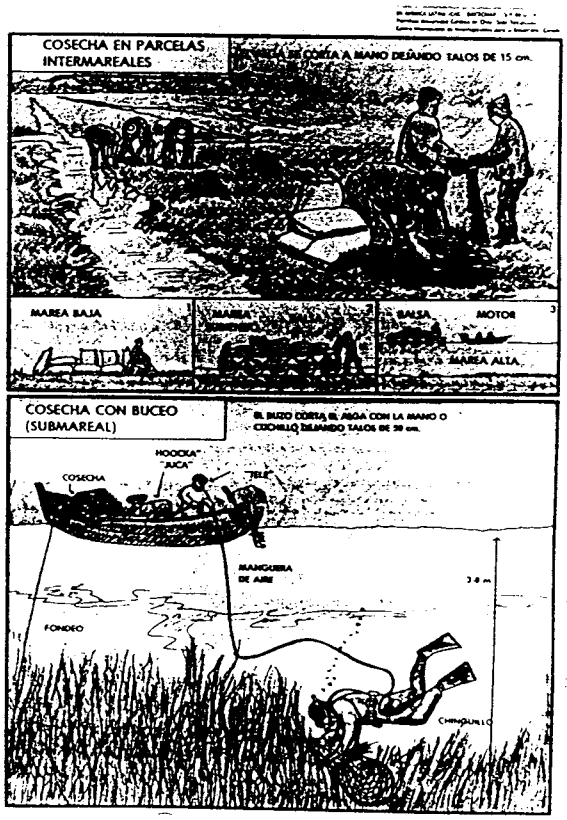
EL CULTIVO DE GRACILARIA — Lámina 3





EL CULTIVO DE GRACILARIA — Lámina 5





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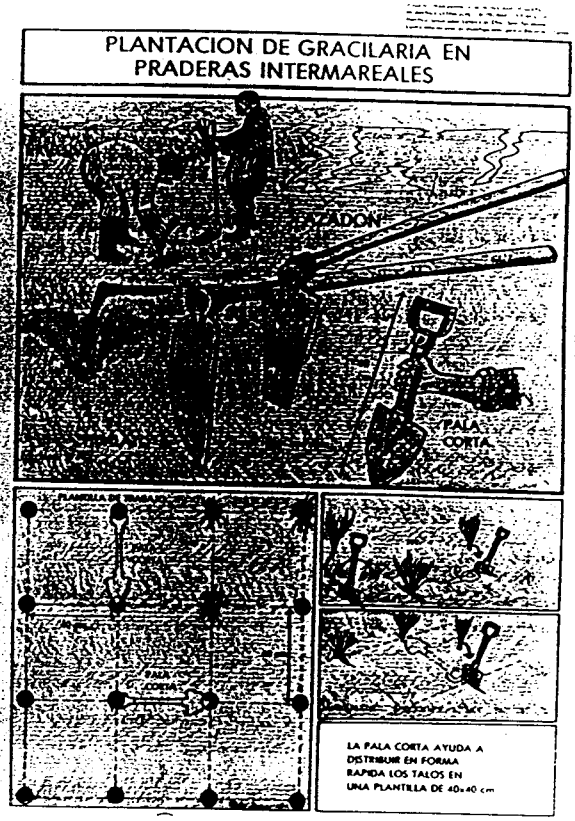
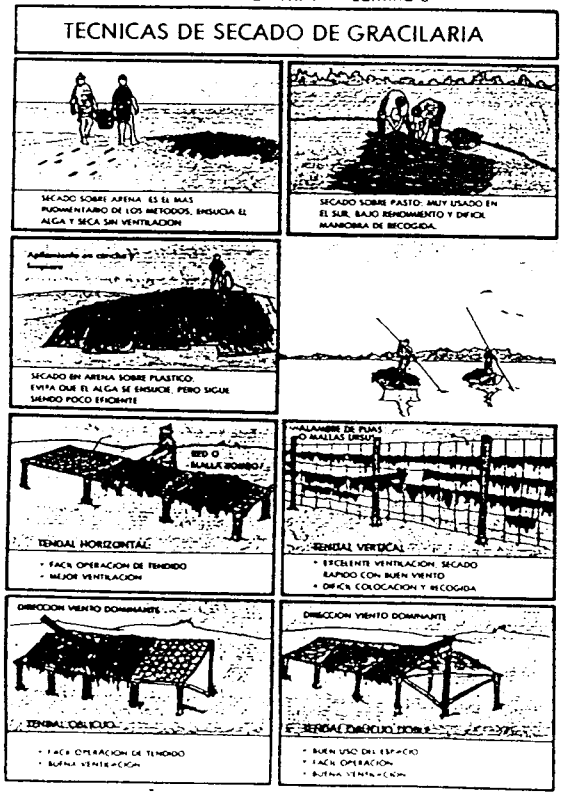
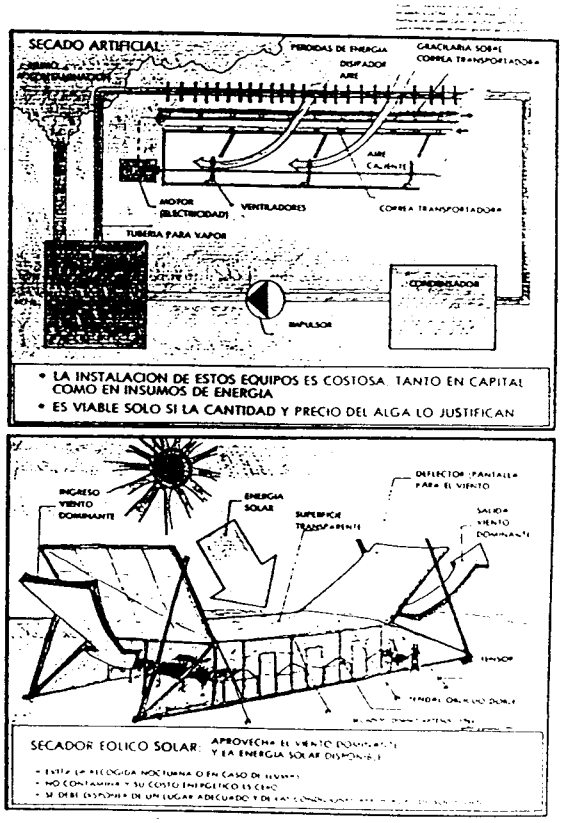


EL CULTIVO DE GRACILARIA — Lámina 6





It is worth to mention that all cases reviewed showed that successful implementation of technology transfer is a long process, usually longer that the time allocated by Technology Development projects to achieve its objective.

Long term planning, and integrated approach are essential elements in the implementation of Technology Transfer activities in the Artisanal Fisheries Sector.

MINI-SEMINAR ON FISHING COMMUNITY DEVELOPMENT WITHIN THE INTEGRATED COASTAL DEVELOPMENT CONCEPT

AGENDA

This meeting was attended by eighteen participants (see annex 1.3. list) from three different Universities (Catholic University of Santiago, Talcahuano, Memorial University of St. John, NF), two fisherman Associations (CONAPACH National, FEREPA, Bio Bio), three consultants (Anthropology, Sociology, Rural Development) and staff from three IDRC supported fisheries projects, in addition to the two Regional Networks Coordinators (Aquaculture, Artisanal Fisheries and the SPO (Fisheries) of IDRC.

The focus of the discussions on this Mini-Seminar was to examine the 3rd component of the ICD Model (i.e. Development), the main elements involved in the production process in which the artisanal fisheries communities are currently engaged in which way this respond to their necessities and affect their way of life, and particularly, how efficiently it is to respond to the challenges posed by the macroeconomic system presently applied in the country.

Discussions were framed in the following agenda:

1.- The Artisanal Fisheries way of production:
- -Access to the Resource.
- -Extraction.
- -Processing.
- -Commercialization.
- -Economy (cost of production, margin of profit).
- -Microenterprises, export market.

2.- The Artisanal Fisheries way of living:
- -Organization.
- -Education.
- -Social Services.

-Women in development.

BACKGROUND

1.- It has been said that Artisanal Fisheries, more than a production activity is a way of life which has ancient cultural and sociological roots which is necessary to understand prior to act upon them.

2.- Artisanal fisherman lives in communities along marine coasts, river and lakes sides forming closely linked human settlements.

3.- The attachment of these communities to their living sites is an important cultural element that gives them their particularly identity.

4.- Activities occurring on those artisanal fisheries communities are referred to two interconnected issues: the artisanal fisheries Way of Production and the artisanal fisherman Way of life (living condition at the community).

5.- The artisanal fisheries way of production (AFWP) has two basic elements:

5.1.- The economic production unit represented by the fishing community and its operational infrastructure (landing, working, and storage, facilities) where the main production activity occurs; (extraction, cultivation, commercialization, processing), and

5.2.- The production means represented by the boats, gear and trade tools utilized in the production process. These elements have a specific weight conventionally agreed upon by the fisherman, and has a special bearing in the "partition" or distribution of the income.

The result of the fisherman work is the fishing product (raw material, and/or elaborated products) which have a market value which can be exchanged for services, goods or plain income.

6 - The Artisanal Fisherman way of life (AFWL)
Is represented by his family, his personal and community life, his traditions and cultural values.
The integral element of AFWL are shelter, health, education, and social security to which it access through the community organization.

The Artisanal Fisheries way of production (AFWP) and the AFWL are conditioned by external factors represented by the access to the Resource and its Environment which is ruled by a set of regulations (fishing laws) and its access to the Market which is conditioned by its insertion in the macroeconomic system.

It is important to note that the production efficiency, and the successful access to market are directly related to the level of proficiency or professional ability of the fishermen. This level depends on the degree of education or knowledge of the fisherman in the use of fishing methods and technologies and in its managerial capability to access the market. These abilities can be improved by appropriate training.

The relation of the AFWP and AFWL to the Resource and the Technology are described in the ICD model, particularly the interaction of the fishing community with the Resource and the Environment, and its proper management which in turn is regulated by the existing legal frame, and the access of the fisherman to the Technology through a Technological Training and Transference process.

DISCUSSION

1.- The Artisanal Fisheries Way of Production (AFWP)

1.1.- Access to the Resource. Legal Status

The fisheries resources and the environment are a property of the Nation. The artisanal fisherman access to it though the assignment of fishing rights to exploit economically the resource and through a lease in the case of restricted access to the environment (for cultivation, exploitation).

The legal system considers the fisheries resources in a similar way as mineral resources where mining companies are given time limited (number of years) exploitation rights to the resources, but do not own the land that belong to the State.

The difference in the case of fishing resources is that we are dealing with renewable resources where the administration of living plants and animals, and its environment is essential to preserve them in time.

This fact is usually forgotten and nobody takes responsibility for the appropriate management of Resource/Environment. While the administration of national property is a responsibility of the state, the "open access" system is contradictory with proper management.

The legal access to coastal leases for mariculture and/or management of natural resources in a limited habitat brings along the necessity and the responsibility to implement some management policies by the users which in turn means to limit the access for the rest.

Present fishing laws are taking this into account and there is strong lobbying at Congress Committees from the different sectors involved (artisanal fisherman, private entrepreneurs, established industrial fisheries), to ensure that the new Law takes into consideration their particular interests.

1.2- The Economic Process (extraction, commercialization, access to market)

The economic process of the artisanal fisheries production differs from other sectors in that demand conditions the supply.

The artisanal fisherman does not control the market and is heavily depending on a price system conditioned by external demand. He does not have control on the local market either, as this is mainly controlled by the middlemen.

Fish constitute a commodity which has a value in itself. This value should include the production cost, but usually it refers only to the cost of extraction and does not include the intrinsic value of the raw material, since this are natural product, not created by man.

There is here a basic difference with live material produced by cultivation where the intrinsic cost of producing an adult animal should include the cost of the reproductive material, the feeding and care until market time. This situation explains why it is not possible for cultivated species to compete in an open market system with similar products obtained from capture fishing.

As far as the labor cost is concerned there is an interesting difference between industrial and artisanal fisheries; in industrial fisheries, cost of production is distributed:

49.5% to capital investment (boats, factories, gears)
10.0.% depreciation cost
39.7% labor

While in artisanal fisheries distribution goes:

40% to capital cost (boats, gear)
60% to labor.

This shows that artisanal fisheries is a labor intensive activity whose benefits goes directly to the producers. Nevertheless, to ensure optimum benefits it is necessary to improve the fisherman access to market. Local market has greater possibilities to operate in favor of artisanal fishermen, provided it can access to it in an organized and efficient manner (commercialization enterprises, cooperatives).

On the other hand, the internationalization of the economy makes it very difficult for the artisanal fishermen to access in favorable conditions to the export market. It is quite possible that the organized access to the local market would pave the way for efficient artisanal fisheries communities to have access to the export market and this is the present trend in the most organized artisanal fisheries sectors (i.e. Chile). Artisanal fishermen perceive this access as a matter of survival.

As far as the intermediaries (middlemen), existing in the local marketing system, the fisherman does not perceive it as a the threat, but rather as an useful element in the commercialization process. In fact, in many cases the middlemen or intermediaries are successful fisherman that have chosen the market operation rather than the production or maintain a hand on both.

1.3 - The organization

The organization is the first step in the road to development for artisanal fishermen.

This organization may take different forms (trade unions cooperatives, fisherman association, etc.).
Fisherman does not favor one or the other, provide it gives them a better chance to solve their problems in a coordinate manner. In fact, often when placed in front of a predetermined system by the local governments, they can easily adjust their own ways to the externally imposed system without changing basically its traditional structures.

The role of fishermen organizations are varied and usually mixed, whether it would be a trade union a cooperative or other i.e.:

- organization of the community
- defense of their rights, needs
- commercialization of their products
- improve living, working conditions

The latest tendency of organizing the artisanal fishermen in microenterprises for commercialization or processing are yet not well documented and carries the risk of miniaturization of the production system which would increase the difficulties of the fisherman to negotiate with large enterprises or exporters.

No matter what type of organization the fishermen may have, organization plays an important role in the artisanal fisheries access to market, credits and management of resources.
The organization can also play an internal role toward the fisherman in enforcing rules, agreements and the accomplishments of financial liabilities.

1.4- Education

Education is an important element in the development process. Education in fisherman combines formal education usually provided by the government (basic and middle level up to 8th grade) and informal education provided by the fishermen themselves through a process of learning by doing.

Primary education in the chilean case is provided by primary schools. Since 1980 the primary schools have been transferred from the Ministry of Education to Municipalities while the Ministry still retain the control of the education curriculum.

60% of the over 5.000 primary schools in Chile are rural. Coastal schools are included in the rural category.
Existing rural school usually show incomplete curricula reaching only until 6 or 7 grade; often they are also forced to pool courses together (i.e., 2nd and 3rd; 3rd and 4th, etc.) due to the lack of teachers.

Another problem faced by the rural schools is the desertion of students of higher grades to be absorbed by production activities.
The type of education (curriculum) is appropriate for urban population not rural and it does not prepare the children for the environment they will be living in as adults (rural, coastal marine).

Once the fisherman children leave the school, they usually go through a process of learning the trade through a system which has ancient cultural and historical roots and consist in gradually learning the tricks of the trade by working with the adult fisherman.

This system still works efficiently up to date and should be the subject of a detailed research by education specialists with the purpose of incorporate it in the training methodology for transference of modern technology.

There have been experiences of specialized training (fishing schools) in the past, which has been faced out for different reasons (economical, changes of policy) and that also requires proper evaluation.

Fisherman unions are now asking for the organization of a formal training system to transfer modern capture, culture and processing technology to the new and old fisherman alike.

This would require a program of research in the training methodology, the creation of an specialized curriculum and a pilot program that could be implemented experimentally in a series of community. Such program would be subject of an evaluation process along the way.

Fisherman wants to be an active partner of the training process in an interactive way, not merely receptors of technological packages.

Women as well have a very important role to play in this process particularly in the children level, as children are more in contact with the mother than with the father in the early stages of their live.

Women can better complement teachers in monitoring, even directing efforts in improving the coastal schools curriculum when formal education is incomplete or lacking.

The average level of fisherman education has been increasing lately with the incorporation of new people coming from other sectors (even with technical background) to the production activities (i.e. mariculture) as a result of the pressure of the demand for marine products.

A program of specialized training for fisherman may make use of these more advanced elements as they represent a readily available manpower for informal training. At any rate this should form part of an integral plan nationally implemented to upgrade the artisanal fisheries sector.

Social Security (SS)

Artisanal Fisherman like any other free worker has access to the SS through enrolment in any of the social security programs existing in Chile. Similar services exist also in other countries of the region (i.e., Peru, Colombia). A condition for this is of course, the regular contribution to the selected funds.

Usually the limitation for the fisherman to access to such services refers to the lack of continuity in the contribution to the system because of cultural background and the instability of their income ("good" and "bad" seasons).

The possibility exist for organized fisherman (National fisherman associations) to establish a SS system particularly applicable to fisherman through negotiations with a local Bank or SS association. This require a certain degree of control of the Fisherman Association on their members in a similar way the Fisherman Association control the contribution to the Union funds.

A formally established SS system would give the fisherman associated not only access to housing, health and retirement benefits but also access to a credit system. This element of the Development component is strongly related to the fisherman organizational level. The more advance the organization is, the better their chances are to access to a convenient solution to their social security problems.

Woman in Development

Woman has an important role to play in Artisanal Fisheries Development in both aspects of the community activity: The Artisanal Fisheries Way of Life (AFWL) and the Artisanal Fisheries Way of Production (AFWP).

In the case of AFWL, as was mentioned previously, woman should be integrated to education and training programs in the community, particularly to complement or supply deficiencies in the education system for children and young people.

In the case of AFWP, women are increasingly involved in processing and commercialization activities. In several projects, woman has successfully explored into the organization of commercial microenterprises (i.e., preparation and marketing of food products) that rapidly find their way into the local market.

A field where woman can also play an important role is in the establishment and maintenance of cultivation systems. A number of experiences recently initiated shows that it is feasible to establish seed supply unit at artisanal level in fisherman community (Brazil, Peru). This unit can produce required seed and larvae for community cultivation activities.

A proper training program could enable young women from the community to take care of these artisanal hatcheries. Such program could be established as pilot activities in a number of communities presently engaged in development projects.

5. ON THE DEVELOPMENT OF A LONG TERM STRATEGY FOR ARTISANAL FISHERIES DEVELOPMENT IN LATIN AMERICA

5.1.- The discussions held during the three Mini-Seminars executed during the IHR assignment were planned to provide a feed back to the FI program on the applicability of the ICD Model for the implementation of a long term strategy of artisanal fisheries development in the continent.

The main question to be answered in the review of the three components of the ICD Model (Resources, Technology, Development) were:

a) How appropriate is the present management of the marine resources and the environment and, in the event of a transference of responsibilities of its administration to the artisanal fisherman, are the fisherman prepare to assume that role ?.

b) What are the existing procedures of technology transference to the artisanal fisheries sector and how efficient are they to assist the fisherman in their transformation from a hunter of wild resources into a cultivator of these resources and an administrator of the coastal environment ?.

c) What are the chances of the artisanal fisherman to increase his share of the production process, participate as an active partner in the commercialization and processing of fishing commodities and through this, improve his living conditions ?.

5.2.- The answer to these questions would provide a clear view of where we stand in the path to the development of the artisanal fisheries sector and what are the required steps to follow up.

5.3.- In term of the administration of the resources and the environment, there is no doubt that it is far from adequate. Most of the participants expressed their strong concern that there was virtually no management of the resources because of the difficulties to stop the overexploitation stimulated by the external demand.

5.4.- The other side of the problem is that the biologists do not have an appropriate management tool since the dynamic models applied in stock assessment are monospecific while most of the coastal resources are multispecifics.

The most promissory alternatives is the development of ecological models for management of coastal areas.

These models consider the environment and the biomass as an integral unit which has to be administered in a coordinate manner. We are exploring in this type of research in a couple of projects (i.e., 88-1024 Plankton Ecology; 89-0048 Invertebrates III) but this trend is largely experimental and it may take some considerable time before they can be utilized as a reliable management tool.

5.5.- All this point out to the difficulties that the fisherman would have to face if he is endorsed with the responsibility to administer the coastal zones. The best chance for the time being is to rely on research groups located at University or NGO's that would provide advice and supervision to fisherman communities who are exploiting coastal leases.

5.6.- On the technology generation and transfer, the discussions showed the lack of a technological transfer policy and of specialized units to implement such transfer.

At the bottom of this is the issue of what is the final purpose of the technological transfer.

Right now it does not seem to be the enhancement of the artisanal fisherman as a valid alternative in the production and commercialization process. The present role of artisanal fisherman is only as a small wheel in the mechanism of industrial production. Such role is replaceable and it may be in the very short run. Only a few elements will be recoverable through specialized training to man the different stages of the sophisticated industrial process of the mariculture factories of the future.

Such scheme does not consider the socio-economic-ecological implicancies that this course of events may have for the resource and environment, the coastal communities and the local population (in terms of food access). It only consider the market demand and the macro-economic trends.

5.7.- By the same token, the artisanal fisherman perceive his insertion in the commercialization process as his only chance of survival. This is partly true, but as he has no control on the market and is primarily a supplier of row material, it is rather unlikely that he may be able to increase his share of the profits and improve his condition.

5.8.- It is important to consider that for the fisherman to enter in the economic process of commercialization as an equal partner it is first necessary for him to develop his own microeconomic scheme. This can only be achieved by creating his own operational space, preferably as a supplier for the local market where he has a better chance as a producer, administrator and elaborator of consumption products.

5.9.- In Mariculture production artisanal fisherman can also play an important role in the different stages of marine animal rearing from larvae to market product and in the management of natural resources in small ecological units such as the ones assigned by leases to coastal communities.

5.10.- For such a plan to take place, it would be necessary to implement a number of research and training activities, utilizing the ICD Model as a guide so that those actions will be coordinated within a common context. Research results could then be naturally integrated into the development process.

6.- IDRC Options and Workplan

6.1.- Much of the developments we see occurring today in Latin America in terms of Artisanal Fisheries (i.e., the increasing importance assigned to this issue, the identification of the main problems, and the coordinated actions to solve those problems) are due to the impact of IDRC actions and advice provided by the Fisheries program to local institutions and research groups.

6.2.- The same ICD Model is an intellectual product derived from the IDRC actions and our interpretation of the reality we have evaluated at regional meetings and open discussions with fishermen, researchers and government agencies.

6.3.- Nevertheless, it would be an error to consider ICD as a final product, a recipe that can be standardized and administrated in a mechanical way. It is primarily a tool that permit to better understand the complexities of a multidisciplinary process such as occurring in Fisheries Development. It is also a two ways vehicle since the experience achieved in the application of the development actions revert to the model in term of adjustments and improvements.

6.4.- The permanent evaluation of these actions i.e., in the two previous regional Artisanal Fisheries Seminars and the last review conducted during the In House Research, are clearly pointing out the direction the IDRC should follow to keep abreast of the process:

i.) It is necessary to establish a pilot program of coastal management in a few selected localities preferably under a joint research institution/fisherman community agreement. Such scheme may take the form of an ecological administration of a coastal lease where aspects of the environment, the energy flow and the rational exploitation of resources (including cultivated species) will be executed in an experimental and carefully monitored system.

The implicancies, impact and extension of environment degradation by pollution should be specially evaluated.

The background for this program can be found in three former fisheries projects: "Invertebrates/Seaweed (Chile), Plankton Ecology (Dalhousie/Chile) and Marine Farms (Chile), where the basic elements of an ecological administration of the marine coastal environment were experimentally tested.

i.i.) It is necessary to continue and expand the research on Technology Transfer methodology and utilization of Projects results initiated two years ago by the application of audiovisual means to training programs at community level.

These activities are essential for the actions planned by fisheries research projects in the field. To achieve this, it would be necessary to train a specialized unit at one of the leading research projects. Discussions are being held with the Memorial University (St. John, NF) to develop a collaborative project for this purpose.

iii.) Commercialization is the main thrust of the Fisherman Association in Chile nowadays. This is not an easy task and its bound to create much frustration and economic failures at the early stages until the artisanal fisherman learn the tricks of the trade.

The fact that the chilean fisherman will have to contend in an unknown and possible hostile environment where the rule of the market are the only rules of the game will not make things easy for microentreprises.

It is not clear how the microentreprises can be smoothly inserted in a macroeconomic system of free enterprise which is not rigged to facilitate their operation, without risking bankruptcy.

It will be necessary to conduct research into the economic operations of microentreprises and even test different alternatives (cooperatives, mixed enterprises, etc.) in carefully monitored real situations to advice the fisherman on the best way to do things. A new type of projects will be required which will be addressed to analyse and adjust the production/commercialization process to successfully navigate in the economic waters.

iv.) The described actions covering the different aspects of the ICD Model should be coordinated and evaluated in the development context, including socio-cultural aspects which are more centrally located as far as the model is concerned. This important judgement element should be situated at the level of the present ICD Committees where a free play of ideas within a multidisciplinary group can occur.

IDRC has been supporting this analytical capability through its Regional ICD Network. This program should continue to guide the program actions in each country where we have ongoing artisanal fisheries activities. We should reinforce in the near future those countries where the ICD Committee are newly established and just initiating activities (i.e., Brazil, Colombia).

6.5.- Artisanal Fisheries is bound to be the focus of important discussions in the near future, as Latin American countries are reviewing their marine legal access structure to adjust it to the new situation of decreasing resources, extended marine pollution and development of aquaculture productive systems.

These problems are presently in the agenda of all regional agencies (CPPS, OLDEPESCA, FAO, IDB, etc.).

IDRC has a leading edge on this discussion because of our early actions on this field and the development of a conceptual frame to interact with the different aspects of the Model. In order to maintain and increase our role in the ongoing discussions we should improve our presence in the international meetings occurring regularly in our region, and let our achievements and experiences be known through the existing publication and the media.

Nevertheless, this may not be sufficient, as publications are scarce and normally outdated. (The last report of the CPPS recently published brings an article wrote by us back in 1989 !). It may be necessary to consider the timely publications of IDRC program results in a special series that can be edited and published directly by IDRC or by the IDRC supported regional Networks.

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Participantes

TALLER RECURSOS Y MEDIO AMBIENTE
Marzo 26, 1991

Ramón Buzeta	Representante Regional Programa Pesquerias - CIID.
Fernando Buckle	CICESE, México
Eduardo Tarifeño	Coordinador Comité DCI-Chile. Jefe Proyecto 3-P-88-0119
Krisler Alveal	Universidad de Concepción. Coordinador Red de Algas Marinas
Tarsicio Antezana	Dpto. Oceanología Universidad de Concepción
Héctor Romo	Dpto. Oceanología Universidad de Concepción
Ricardo Galleguillos	Dpto. CIEMAR , P. Universidad Católica-Talcahuano
Alberto Arrizaga	P. Universidad Católica de Chile -Talcahuano Jefe Proyecto Desarrollo Pesquero Artesanal 3-P-86-0116-02
Adriana Poblete	P. Universidad Católica de Chile -Talcahuano Jefe Proyecto Granjas Marinas INB-096-E-
Jorge Chocair	Consultor Comité DCI, Chile
Juan Carlos Castilla	Dpto.Ecología P. Universidad Católica de Chile-Santiago
Carlos Moreno	Instituto Ecología, Universidad Austral de Chile
Carlos Bocanegra	Instituto Ecología, Universidad Austral de Chile
Jorge Valenzuela	Proyecto Red de Algas Marinas
Gustavo Palma	Proyecto 3-P-86-0116-02
Manuel Véliz	Proyecto 3-P-86-0116-02
Cristian Cornejo	Proyecto 3-P-86-0116-02

Participantes

TALLER TRANSFERENCIA DE TECNOLOGIAS
Marzo 15-16, 1991.

Ramón Buzeta	Representante Regional Programa Pesquerias - CIID.
Armando Hernández	Coordinador Red Regional Acuicultura, Programa Pesquerías - CIID.
Rogelio Villanueva	Coordinador Red Regional Pesca Artesanal, Programa Pesquerías - CIID.
Laerte Batista de Oliveira	Presidente Comité Consultor, Red Regional Acuicultura, Programa Pesquerías - CIID.
Eduardo Tarifeño	Coordinador Comité DCI-Chile. Jefe Proyecto 3-P-88-0119
Raul Molina	Consultor Comité DCI-Chile.
Rosa Flores	Consultor Comité DCI-Chile.
Krisler Alveal	Universidad de Concepción. Coordinador Red de Algas Marinas
Alberto Arrizaga	P. Universidad Católica de Chile -Talcahuano Jefe Proyecto Desarrollo Pesquero Artesanal 3-P-86-0116-02
Adriana Poblete	P. Universidad Católica de Chile -Talcahuano Jefe Proyecto Granjas Marinas INB-096-E-
Leopoldo Benavides	FLACSO-PRAIS.
Jorge Valenzuela	Proyecto Red de Algas Marinas

Participantes

TALLER DESARROLLO COSTERO INTEGRADO
Abril 5 y 6, 1991

Ramón Buzeta	Representante Regional Programa Pesquerias - CIID.
Anthony Dickinson	Memorial University Canadá
Tony Williamson	Memorial University Canadá
Rogelio Villanueva	Coordinador Red Regional Pesca Artesanal, Programa Pesquerías - CIID.
Humberto Chamorro	Presidente CONAPACH
Hugo Arancibia	Presidente FEREPA Bío Bío
Jorge Lobos	FEREPA Bío Bío
Eduardo Tarifeño	Coordinador Comité DCI-Chile. Jefe Proyecto 3-P-88-0119
Raul Molina	Consultor Comité DCI-Chile.
Alberto Arrizaga	P. Universidad Católica de Chile -Talcahuano Jefe Proyecto Desarrollo Pesquero Artesanal 3-P-86-0116-02
Ricardo Galleguillos	Dpto. CIEMAR, P. Universidad Católica-Talcahuano
Adriana Poblete	P. Universidad Católica de Chile -Talcahuano Jefe Proyecto Granjas Marinas INB-096-E-
Leopoldo Benavides	FLACSO-PRAIS.
Jorge Valenzuela	Proyecto Red de Algas Marinas
Gustavo Palma	Proyecto 3-P-86-0116-02
Manuel Véliz	Proyecto 3-P-86-0116-02
Cristian Cornejo	Proyecto 3-P-86-0116-02
Juan Carvajal	Proyecto 3-P-88-0119

Gustavo Palma	Proyecto 3-P-86-0116-02
Manuel Véliz	Proyecto 3-P-86-0116-02
Cristian Cornejo	Proyecto 3-P-86-0116-02
Juan Carvajal	Proyecto 3-P-88-0119
Jorge Silva	Proyecto Granjas Marinas
Patricia Quiroz	Proyecto 3-P-86-0116-02
Juan C. Molina	Estudiante Tecnología Recursos del Mar
Rodrigo Estero	Estudiante Tecnología Recursos del Mar
Michael Arias	Estudiante Tecnología Recursos del Mar
Guillermo Hurtado	Estudiante Tecnología Recursos del Mar